works (jointly with W. G. Tremewan and the inspired art-work of Arthur Smith) was the two volume *British Tortricoid Moths* which was published by the Ray Society, London, 1973/1979.

He was an Honorary Member of the British Entomological & Natural History Society which he joined in 1946 when it was known as the South London Entomological & Natural History Society. In 1951 he became a Fellow of the Royal Entomological Society and he also served on the Council and as Vice-President of the Ray Society.

The *Entomologist's Gazette* was founded in 1950 and John was one of the first subscribers: he was a member of its editorial panel from 1953 to 1979, acting as Assistant Editor or Editor from 1954 to 1965.

On his retirement he became acutely aware, cut off as he was from the library resources of the Museum, of the need for an up-to-date and accurate list of the Lepidoptera of Great Britain and Ireland and bent his energies to that end. The *Checklist of the Lepidoptera recorded from the British Isles* was published under his own imprint in 1998, a second, revised, edition appearing in 2000.

He was a quiet and reserved man but was comfortably at ease with a host of fellow entomologists. In all our long acquaintance I never heard him say an unkind word about anybody—indeed the only harsh words he ever uttered were about something over which he had no control—inclement weather on a collecting trip!

E. W. CLASSEY

SHORT COMMUNICATION

Combative behaviour in *Anomoia purmunda* (Harris) (Diptera: Tephritidae).—On 5.vii.1999, I observed several individuals of *Anomoia purmunda* assembled on the patio at my home near Loddon Bridge, Earley, Reading (SU 763716). The patio was some 20 metres from a large hawthorn *Crataegus monogyna* Jacq. (Rosaceae), the most probable host plant, though *Pyracantha coccinea* Roemer and *Cotoneaster* sp., also known host plants were present. There were about 13 flies in the group, and near its centre a pair of individuals were standing with their heads touching (Fig. 1). They attempted to push each other over backwards. The remaining individuals appeared to be watching the proceedings. I observed this behaviour for about 10 to 12 minutes, though not continuously since I needed to fetch a camera. When one of the combatants lost its balance the combat ceased and another two individuals began the same type of behaviour. During the time I was watching I never observed more than one pair of individuals fight at any one time. The other flies continued to watch the proceedings intently.

Interactions between males belonging to the family Tephritidae are reviewed by Preston-Mafham & Preston-Mafham (1993). A number of species, particularly those that have a range of food plants rather than a single host, form leks for display and ritual combative behaviour. *Anomoia purmunda* appears to be one of these. Similar activities also occur in Drosophilidae. Both families are unusual in the animal kingdom in that males rather than females emit sex pheromones, and there are obvious advantages in having jousting competitions so that the concentration of pheromones in one place will make it easier for the females to detect males when the latter are some distance from the food plant.

The tribe Trypetini, to which *A. purmunda* belongs, contains a number of species that feed, display and mate on other substrates (Han 2000). In the celery fly *Euleia heraclei* (L.), adult insects are hardly ever seen on their host plants whereas the

Fig. 1. Jousting by the tephritid *Anomoia purmunda*.

feeding and mating sites occur on nearby trees (Leroi 1997, quoted in Han 2000). Head butting behaviour has been consistently observed among males in this tribe.

Lekking behaviour has other advantages for large and well-fed males such as the Mediterranean fruit fly *Ceratitis capitata* (Wiedemann). Kaspi, Taylor & Yuval (2000) fed adults of this fly on diets containing different levels of protein and found that those consuming protein-rich diets were more likely to emit pheromone in leks. Among the protein-fed males, large individuals tended to mate successfully earlier than smaller ones.

Males of the tephritid genus *Phytalmia* from Australasia are reported to engage in ritualised combat in a manner similar to *A. purmunda*, but these species have long cheek projections which assist in the pushing match (Moulds, 1977, quoted in Preston-Mafham & Preston-Mafham 1993). Species of Diopsidae and Platystomatidae use their eye stalks for similar purposes. Jousting appears to be rare among Diptera other than in the families mentioned.–RON BOYCE, 447c Wokingham Road, Earley, Reading RG6 7EL.

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